CLAIMS

We claim:

1. A method for inhibiting the transcription or translation of mutant cytochrome c oxidase encoding genes, comprising the steps of:

a) contacting said genes with antisense sequences which are specific to said mutant sequences; and

b) allowing hybridization between said target mutant cytochrome c oxidase gene and said antisense sequences under conditions under which said antisense sequences bind to and inhibit transcription or translation of said target mutant cytochrome c oxidase genes without preventing transcription or translation of wild-type cytochrome c oxidase genes.

2. The method of claim 1 wherein Alzheimer's disease is treated and wherein said cytochrome c oxidase genes contain mutations at one or more codons selected from the group of:

(a) codon 155, codon 167, codon 178, codon 193, codon 194, and codon 415 of the cytochrome c oxidase I gene; and

(b) codon 20, codon 22, codon 68, codon 71, codon 74, codon 90, codon 95, codon 110, and codon 146 of the cytochrome c oxidase II gene.

3. A probe for detection of a disease state associated with one or more mutations in mitochondrial cytochrome c oxidase genes comprising a nucleotide sequence complementary to either of the sense and anti-sense strands of said one or more mutations in said mitochondrial cytochrome c oxidase genes.

4 . The probe of claim 3 wherein said probe includes a region complementary to the sense and anti-sense strands of one or more codons selected from the group of:

(a) codon 155, codon 167, codon 178, codon 193, codon 194, and codon 415 of the cytochrome c oxidase I gene; and

(b) codon 20, codon 22, codon 68, codon 71, codon 74, codon 90, codon 95, codon 110, and codon 146 of the cytochrome c oxidase II gene.

5 . A kit comprising a probe for detection of an Alzheimer's disease genotype, said probe comprising a nucleotide sequence complementary to either of the sense and anti-sense strands of a mitochondrial cytochrome c oxidase gene.

6 . The kit of claim 5, wherein said probe includes a region complementary to the sense and anti-sense strands of one or more codons selected from the group of:

(a) codon 155, codon 167, codon 178, codon 193, codon 194, and codon 415 of the cytochrome c oxidase I gene; and

(b) codon 20, codon 22, codon 68, codon 71, codon 74, codon 90, codon 95, codon 110, and codon 146 of the cytochrome c oxidase II gene.

7 . A therapeutic composition comprising antisense sequences which are specific to mutant cytochrome c oxidase genes or mutant messenger RNA transcribed therefrom, said antisense sequences adapted to bind to and inhibit transcription or translation of said target mutant cytochrome c oxidase genes without preventing transcription or translation of wild-type cytochrome c oxidase genes.

8 . The therapeutic composition of claim 7, wherein Alzheimer's disease is treated and wherein said cytochrome c oxidase genes contain mutations at one or more codons selected from the group of:

(a) codon 155, codon 167, codon 178, codon 193, codon 194, and codon 415 of the cytochrome c oxidase I gene; and

(b) codon 20, codon 22, codon 68, codon 71, codon 74, codon 90, codon 95, codon 110, and codon 146 of the cytochrome c oxidase II gene.

9. A method for detecting the presence of Alzheimer's disease in a subject, comprising the steps of:

a) obtaining a biological sample containing mitochondria from said subject; and

b) interrogating at least one variant polypeptide, arising from one or more mutations in one or more subunits of mitochondrial cytochrome c oxidase genes, which correlates with the presence of Alzheimer's disease.

10. The method of claim 9, wherein said mutation is interrogated using monoclonal antibodies or polyclonal antibodies.

11. A ribozyme adapted to hybridize to and cleave mitochondrial mRNA molecules that encode for mutant cytochrome c oxidase subunits.